

# Chromosomal data on six araneomorph spiders belonging to the families Lycosidae and Gnaphosidae

(Araneae: Araneomorphae)

Zübeyde Kumbıçak, Serap Ergene, Saadet Saygıdeğer

**Abstract.** The karyotype and the course of meiosis in six species of araneomorph spiders of the families Lycosidae and Gnaphosidae are analysed, based on material from Israel, Turkey and the Czech Republic. The number of diploid chromosomes ( $2n$ ) and the sex-determining system of males were determined as follows: *Pardosa alacris* (C. L. Koch, 1833) and *Pardosa saltans* (Töpfer-Hofman, 2000) (Lycosidae)  $2n=28$  ( $26+X_1X_2$ ), *Callilepis cretica* (Roewer, 1928), *Drassodes pubescens* (Thorell, 1856), *Drassylus pumilus* (C. L. Koch, 1839) and *Zelotes strandi* (Nosek, 1905) (Gnaphosidae)  $2n=22$  ( $20+X_1X_2$ ). *Pardosa alacris* and *P. saltans* have 13 autosomal bivalents and two univalent sex chromosomes at prophase and metaphase of the first meiotic division. In contrast to this, all gnaphosids have 10 autosomal bivalents and two sex chromosomes during these meiotic stages.

**Key words.** Karyotype, meiosis, spider, sex-determining mechanism.

## Introduction

Out of over 40,000 species of spiders (PLATNIK 2008), the cytogenetics of about 600 have been studied (KRÁL 1994, ARAÚJO et al. 2005, ŘEZÁČ et al. 2006). The diploid chromosome numbers of spiders range from 7 to 94 (SUZUKI 1954). The vast majority of entelegyne araneomorph spiders have acrocentric chromosomes, but in some groups, namely in the family Dictynidae and in the haplogyne lineage, biarmed chromosomes predominate (ŘEZÁČ 2006). Spiders have the multiple sex chromosome mechanism ♂  $X_1X_2$  / ♀  $X_1X_1X_2X_2$ . This system has been found in 77% of the spiders studied so far (ARAUJO et al. 2005).

The order Araneae is divided into three phylogenetic lineages: Mesothelae, Mygalomorphae and Araneomorphae (CODDINGTON & LEVI 1991). The Araneomorphae consists of two major groups, the haplogyne and entelegyne clades, and comprises nearly 36,000 species belonging to 94 families. Araneomorph spiders are cytogenetically the best known spiders.

Lycosids and gnaphosids are among the best studied groups in entelegyne spiders. More than 90 species of lycosids and 30 species of gnaphosids have been investigated cytogenetically. Male diploid number are between 18 and 30 in lycosids and between 22 and 28 in gnaphosids (HACKMAN 1948, SUZUKI 1954, BOLE-GOWDA 1950, SHARMA et al. 1958, KAGEYAMA et al. 1978, SRIVASTAVA & SHUKLA 1986, PAINTER 1914, GORLOV et al. 1995). In order to understand better the cytogenetics of these araneomorph families, we have studied two lycosid and four gnaphosid species that have not previously been investigated.